



## **Effect of feeding camel colostrum extract on some Reproductive Hormones in Female Rats**

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### **Abstract**

Finding natural products to prevent or reduce the reproductive system problems is still a goal to many researchers. Natural substances are characterized by their high safety margins compared to the synthetic ones. The aim of this research was to focus on the effect of camel colostrum extract feeding on some reproductive hormones represented here by Follicle-stimulating hormone (FSH) & Luteinizing hormone (LH) in female rats. Amounts of 30 ml each of Iraqi camel colostrum were collected post-parturition at 0, 6, and 12 hours in sterile containers and sent directly in icebox to a laboratory. The colostrum samples were centrifuged twice at 5000 rpm for 10 minutes. The supernatants were filtrated, and the extracts were refrigerated at 4°C until use. Twenty albino rats were grouped randomly into four equal groups (five rats per group). The control group (CG) was given tap water only, while the treatment groups (0 G, 6G, and 12G) were given 0.1 ml of the extract orally for one week. After 30 days, the rats were sacrificed. Then quickly, blood samples were collected and immediately spun using a centrifuge at 5000 rpm for 5 minutes to collect serum. Finally, serum was measured for the level of FSH and LH. The levels of the FSH & LH showed significant increases in all treated groups compared to the control group.

**Keywords: Camel, Colostrum, extract, FSH, LH, female, rats.**

**تأثير التغذية بمستخلص لبأ الناقة على بعض الهرمونات الجنسية ( الهرمون المحفز للجريب والهرمون اللوتيني) في أنثى الجرذان.**

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### **الخلاصة:**

إن إيجاد مواد طبيعية تمنع أو تقلل من مشاكل الجهاز التكاثري قد بقي هدفا للعديد من الباحثين بفعل أفضليتها (ليس لها تأثيرات جانبية) مقارنة بالعقارات الكيميائية. تهدف الدراسة إلى تسليط الضوء على تأثير التغذية بمستخلص لبأ الناقة على الهرمونات الجنسية ( الهرمون المحفز للجريب والهرمون اللوتيني) في أنثى الجرذان. أخذت عينات بمقدار 30 مل من لبأ الناقة بفترات بعد الولادة مباشرة وستة ساعات واثنا عشرة بعد الولادة في قناني معقمة وأرسلت للمختبر في حاوية ثلج. تم إجراء عملية الطرد المركزي لمزيج لعينات اللبأ بسرعة 5000 دورة في الدقيقة ولمدة عشرة دقائق في كل عملية ثم رشح السائل الطافي ترشيحا نانويا ولمرتين وحفظ بعدها في الثلجة لحين الاستعمال. تم تقسيم عشرون جرذا بصورة عشوائية إلى أربعة مجاميع بواقع خمسة جرذان في كل مجموعة حيث اعتبرت المجموعة الأولى مجموعة سيطرة للمقارنة معها وعولجت بالماء عن طريق الفم بينما اعتبرت المجموعة الثانية مجموعة الصفر (بعد الولادة مباشرة) والمجموعة الثالثة مجموعة الستة ساعات والمجموعة الرابعة مجموعة الاثنا عشرة ساعة حيث تجرّع جميع هذه المجموعات الثلاثة وحسب مدة اللبأ المحددة لها

بكمية 1 مل يوميا ولمدة اسبوع , وعند انتهاء التجربة بعد 30 يوما تم قتل الجرذان تحت تأثير المخدر وجمعت منها عينات الدم حالا وخضعت لعمليات الطرد المركزي بسرعة 5000 دورة في الدقيقة ولمدة خمسة دقائق لغرض قياس مستوى الهرمون المحفز للجريب والهرمون اللوتيني في مصل الدم. أظهرت النتائج زيادة ملحوظة إحصائيا لمستوى الهرمونين في جميع مجاميع العلاج وكانت أعلاها في المجموعة الثانية (مجموعة اللبأ بعد الولادة مباشرة) .

## Introduction

In the last decades a lot of researchers studied the effect of many materials such as dietary lipids, celery leaves, traditional edible oils and soybean on the reproductive system (1,2,3,4). According to our knowledge, there is no previous study focused on the effect of camel colostrum extract feeding on female reproductive hormones. Few researches have mentioned that camel colostrum is a good source of bioactive factors such as antioxidant and antihypertensive peptides that are released after enzymatic hydrolysis or fermentation of camel milk (5). Due to the fact that successful reproduction of an animal depends on its nutritional status, so nutrition and reproduction are always linked to each other (6,7). Since we know that excessive or insufficient production of hormone (s) or lack the response by certain tissues to normal circulating hormones may lead to endocrine disorders(8). This is resulted in connecting FSH and LH as well as other reproductive hormones such as progesterone, estradiol, testosterone, and prolactin to the activity of female cycle (9). The aim of this research is to study the effect of camel colostrum extract feeding on FSH and LH hormones in female Albino rats.

## Materials and methods

The study was performed at the Public Health Department, College of Veterinary Medicine, University of Al- Qadisiyah from November 2016 to January 2017.

### 1. Experimental design:

Thirty milliliter of colostrum from Iraqi camels (*Camelus dromedarius* ) were collected at 0, 6, and 12 hours after

parturition in sterile containers and sent directly in icebox to a laboratory. The colostrum samples were centrifuged twice at 5000 rpm for 10 minutes. The supernatants were difiltrated by microfiltration system (Vacuum Membrane Filter Funnel Apparatus, ShaoxingWorner Lab Equipment CO. LTD, Shanghai, China) using microfiltration membrane (0.22  $\mu$ m), and the extracts were refrigerated at 4°C until use. Twenty albino rats (*Rattus norvegicus*) with mean weight of  $256.3 \pm 2.06$  were obtained from the Animal Caring Unit, Department of Physiology, College of Veterinary Medicine, University of Al-Qadisiyah. The animals were grouped randomly into four groups, and each group contained five rats. The groups were classified into control group (CG), rats were given tap water only, and treatment groups (0G, 6G, and 12G) were given 0.1 ml of the extract orally for one week .

### 2. Collection of blood samples:

After 30 days, the rats were sacrificed. Then quickly, blood samples were collected and immediately spun using a centrifuge at 5000 rpm for 5 minutes to collect serum. Finally, serum was measured for the level of FSH and LH.

### 3. Statistical analysis:

The data collected were analyzed with one-way ANOVA test using SPSS software, at  $P \leq 0.05$ .

### Results

The results of FSH levels as displayed in table 1 are clearly showing significant differences at  $p \leq 0.05$  between all groups in the first three weeks. The results are represented by mean  $\pm$  SE.

**Table 1: The mean  $\pm$  SE of FSH (mIU/ml) of the experimental groups.**

<b>Time Group</b>	<b>1<sup>st</sup> Week</b>	<b>2<sup>nd</sup> Week</b>	<b>3<sup>rd</sup> Week</b>	<b>4<sup>th</sup> Week</b>
CG	0.085 $\pm$ 0.005 D	0.092 $\pm$ 0.003 C	0.094 $\pm$ 0.009 A	0.118 $\pm$ 0.024 A
0 G	0.170 $\pm$ 0.007 B	0.198 $\pm$ 0.003 A	0.238 $\pm$ 0.013 B	0.185 $\pm$ 0.014 A
6 G	0.132 $\pm$ 0.005 C	0.162 $\pm$ 0.009 B	0.212 $\pm$ 0.012 B	0.152 $\pm$ 0.006 A
12 G	0.228 $\pm$ 0.008 A	0.160 $\pm$ 0.004 B	0.156 $\pm$ 0.006 C	0.208 $\pm$ 0.053 A

\*Different letters mean significant differences at  $P \leq 0.05$ .

The results of the LH in table 2 are clearly showing significant differences at  $P \leq 0.05$  between all groups. The results are represented by mean $\pm$ SE

**Table 2: The mean $\pm$ SE of LH (mIU/ml) of the experimental groups.**

<b>Time Group</b>	<b>1<sup>st</sup> Week</b>	<b>2<sup>nd</sup> Week</b>	<b>3<sup>rd</sup> Week</b>	<b>4<sup>th</sup> Week</b>
CG	0.306 $\pm$ 0.020 A	0.286 $\pm$ 0.025 A	0.258 $\pm$ 0.025 A	0.274 $\pm$ 0.024 A
0 G	0.488 $\pm$ 0.043 B	0.540 $\pm$ 0.049 B	0.552 $\pm$ 0.043 B	0.292 $\pm$ 0.021 A
6 G	0.400 $\pm$ 0.45 B	0.512 $\pm$ 0.013 B	0.480 $\pm$ 0.030 B	0.186 $\pm$ 0.025 B
12 G	0.320 $\pm$ 0.037 C	0.366 $\pm$ 0.005 A	0.360 $\pm$ 0.010 C	0.158 $\pm$ 0.012 C

\*Different letters mean significant differences at  $P \leq 0.05$ .

### Discussion

Reproductive system problems are one of the critical topics that researchers try to resolve. In this regard, using natural substances is substantial due their beneficial effects such as those related to their safety. The results in tables 1 show clear significant differences of FSH levels between the experimental groups in the first three weeks while there are no significant differences at the end of the last week. Also it is clear that FSH level at the end of the third week in 0G is (0.238 $\pm$ 0.013) which is higher than other groups. This increase can be due to the effect of the high levels of bioactive factors and antioxidants that are present in the very

early flows of the camel colostrum after parturition. The effects of these active materials might have influenced the pituitary gland and resulted in releasing more FSH (5). These results are in agreement with other studies such as (5). The results in table 2 also show significant differences of LH between all groups along the period of the study, and the highest level of LH is 0.552 $\pm$ 0.043 at the end of the third week. These results may indicate the high level of bioactive factors that enrich the camel colostrum (9). In addition, the results of this study also increase the attention to the importance of the effects of the dual centrifugation and dual microfiltration on

the concentration of these bioactive factors in the colostrum. It is important to notice that the results are very beneficial for veterinarians who deal with animal reproductive conditions especially in our country that has a lot of camels which need more studies and healthcare. The reason that colostrum increased FSH and LH is that Relaxin (Rx), a bioactive factor component of colostrum, might have induced this elevation. In addition, Rx helps in developing early life maternal systems (10). Rx was found to increase the expression of estrogen receptors in the uterus of newborn animal females during the first 2 days of life (11, 12). It had been found that Rx increased the levels of circulating estrogen in women (13). However, Rx allows FSH to enhance the process of genital cell differentiation at early age of rat life (14). Finally in human male, Rx-3 increased the levels of FSH which indicates a positive correlation between the two hormones (15). Thus colostrum containing these bioactive factors can enhance the development of neonatal genital and maternal systems.

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